



# Pitfalls and delay in the diagnosis of Pancoast tumour presenting in orthopaedic units

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**Pancoast tumours present a difficult and peculiar problem. Their clinical manifestations may be extrapulmonary. The underlying lesion may be missed in patients presenting with predominantly orthopaedic symptoms. We present four consecutive cases, which were referred to our clinic and the diagnosis was made with mean delay of 18.5 months from the beginning of symptoms.**

*Key words:* Pancoast tumour – Delayed diagnosis – Orthopaedic clinic

The misleading features in the diagnosis of the Pancoast tumour have long been recognised. The history of musculoskeletal complaints or distal neurological findings in the upper limb may initially mislead the clinician. Unfortunately, long delays in the correct diagnosis from the beginning of the symptoms continue to occur. Delay in the diagnosis may affect the treatment plan and the prognosis or even the palliation quality for those patients.

## Case Reports

The following cases, which were referred to our clinic, illustrate the pitfalls in the diagnosis of Pancoast tumour and highlight the importance of the early diagnosis and appropriate management.

### Case 1

A 69-year-old retired motor mechanic was referred to our clinic after 9 months' history of left sided neck pain and left shoulder pain, which radiated down to the medial forearm, little and ring fingers. A more detailed history revealed heavy smoking up to 10 years before his referral and COAD in the past. Clinical examination showed: C-7, C-8, T-1 distribution hypesthesia, wasting with concomitant weakness in the hypothenar muscles and reduction in the range of movements by 40% in the cervical spine.

Radiographs of the cervical spine confirmed moderate spondylosis (Fig. 1). Chest X-rays demonstrated a possible opacity in the lung apex, however, that was reported as being within normal limits. The MRI scan raised doubts about the responsibility of the spondylosis for the patient's neurological signs.

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**Figure 1** Lateral cervical spine X-rays of case 1. Note the spondylosis in the lower cervical spine

Because of deterioration of the 'ulnar nerve' symptoms and tenderness in the sulcus lateral to the medial epicondyle, neurolysis and anterior transposition of the ulnar nerve was performed 4 months after referral. The symptoms recurred about 1.5 months later.

Nerve conduction studies were performed and the patient was referred for a neurosurgical opinion.

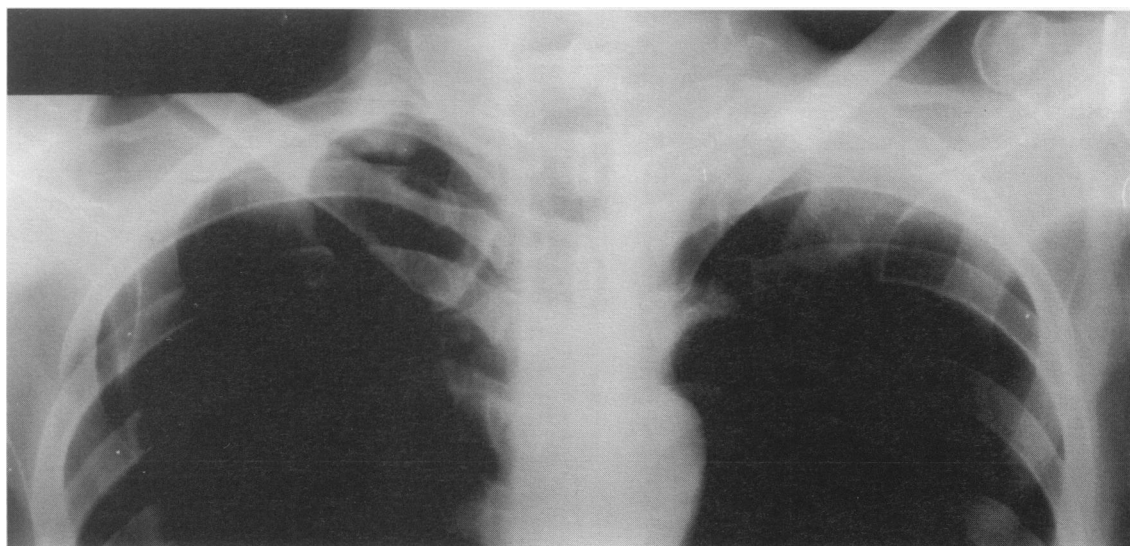
Sixteen months from his referral, he was admitted urgently because of weight loss, hyponatraemia and lethargy. Repeat chest X-rays showed a Pancoast lesion (Fig. 2) and the patient was referred for palliative radiotherapy and analgesia.

#### *Case 2*

A 67-year-old retired carpenter was referred to our clinic because of persistent lower neck pain, refractory to anti-inflammatory medications. He had been a smoker up to 13 years prior to referral and he had chronic bronchitis and mild weight loss within 12 months. The patient's main complaint was the moderate but continuous neck pain, which was radiating down to his right arm. On examination, he was found to have C-7, C-8, T-1 hypesthesia and right hand weakness. Cervical spine and chest X-rays (Figs 3 & 4) confirmed the cervical spondylosis and demonstrated a Pancoast tumour in the apex of the right lung, respectively. The patient was treated on chemotherapy and steroids. He died about two years after the referral.

#### *Case 3*

A 69-year-old man was referred and admitted as an emergency in the orthopaedic department because of a 7 month history of severe pain in his right shoulder and right arm, radiating to the upper chest on the same side. He had been previously referred to a neurosurgical clinic of another hospital and had been treated on NSAIDs. The provisional diagnosis was severe cervical spondylosis.



**Figure 2** The upper half of the (PA) view chest X-rays of case 1. Note the Pancoast lesion in the apex of the left lung

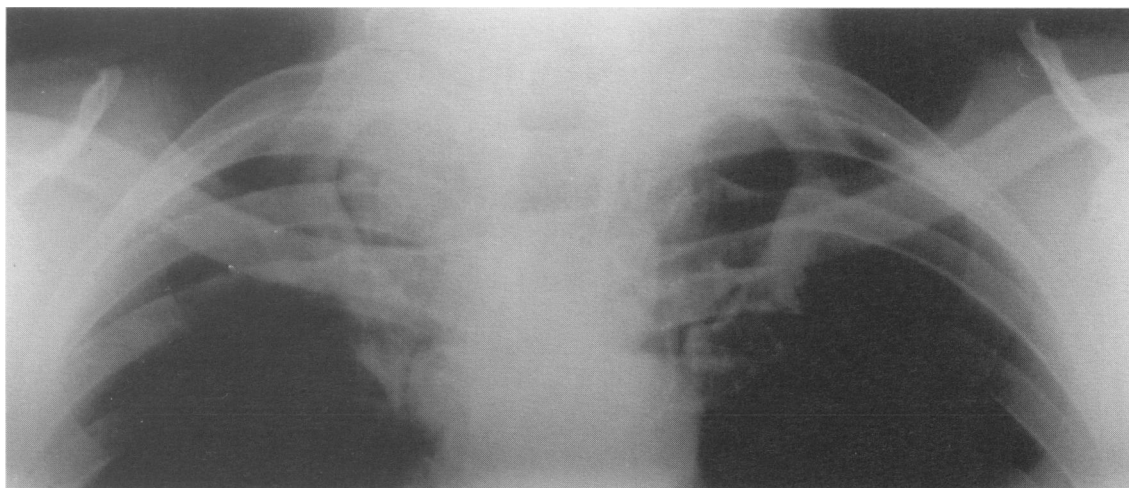
Thorough history revealed a heavy smoker who had mild weight loss recently. On clinical examination there was considerable proximal muscle wasting, but a reasonable range of movements in the cervical spine. Hypesthesia in C-8 and T-1 distribution was noted.

Cervical spine X-rays showed mild spondylosis (Fig. 5) but the chest X-rays demonstrated a Pancoast lesion in the apex of the right lung (Fig. 6).

The patient was treated with palliative radiotherapy and analgesia. He died 18 months after the diagnosis was made.



**Figure 3** Lateral X-rays of the cervical spine in case 2. Note the spondylosis in the lower cervical spine



**Figure 4** The upper half of the (PA) view chest X-rays in case 2. Note the Pancoast tumour in the apex of the right lung

#### Case 4

A 67-year-old retired builder was referred to our clinic with a 2 years' history of right shoulder pain spreading down to the medial aspect of his arm and up to the same side of the neck. He had 6 months' history of intermittent pins and needles in the little finger and hypothenar eminence of his right hand. He was a smoker and admitted to an occasional 'smokers cough' without any other symptoms.

On clinical examination his shoulder movements were restricted and tender. Radiologically, the significance of the apical lesion was not initially appreciated (Fig. 7) and the patient was treated on NSAIDs symptomatically.

Six months later, he was referred to the chest clinic because of deterioration and additional weight loss. At that time, a chest X-ray demonstrated a significant Pancoast tumour (Fig. 8). The patient was treated with palliative radiotherapy.

#### Discussion

The Pancoast tumour was originally described in 1932.<sup>1</sup> It is a rare lung tumour comprising about 3% of all lung tumours.<sup>2</sup> It is recognised as the most common non-metastatic malignancy to involve the brachial plexus.<sup>3</sup> Pancoast tumours are situated in the superior pulmonary sulcus, in the apex of the lung. They lie in the tight space of the thoracic inlet adjacent to the first rib and the first thoracic vertebra. They have in close proximity the lower nerve roots of the brachial plexus, as well as the subclavian artery and vein, common carotid artery, phrenic, vagus and recurrent laryngeal nerve, sympathetic chain and stellate ganglion. The tumour may thus invade or compress any of those



**Figure 5** Lateral X-rays of cervical spine of case 3. Note the mild spondylosis in the middle third of the cervical spine

structures with different symptoms and signs, some of which may be musculoskeletal.

Symptoms of shoulder and neck pain, brachialgia and distal neurological signs may result in referral to the orthopaedic clinic. Associated weight loss, hoarseness, dyspnoea or cough can co-exist with the tumour<sup>4,5</sup> and should raise the index of suspicion.

Clinical findings may include supraclavicular fullness, Horner's syndrome, and prominence of the superficial jugular venous system, discoloration and oedema of the upper extremity.<sup>4</sup>

Complete roentgenographic evaluation includes postero-anterior and lateral chest X-rays as well as apical lordotic projection. When in doubt, the chest CT scan will confirm the diagnosis. EMG can be helpful in cases with distal neurological signs in the upper limb.<sup>6</sup>

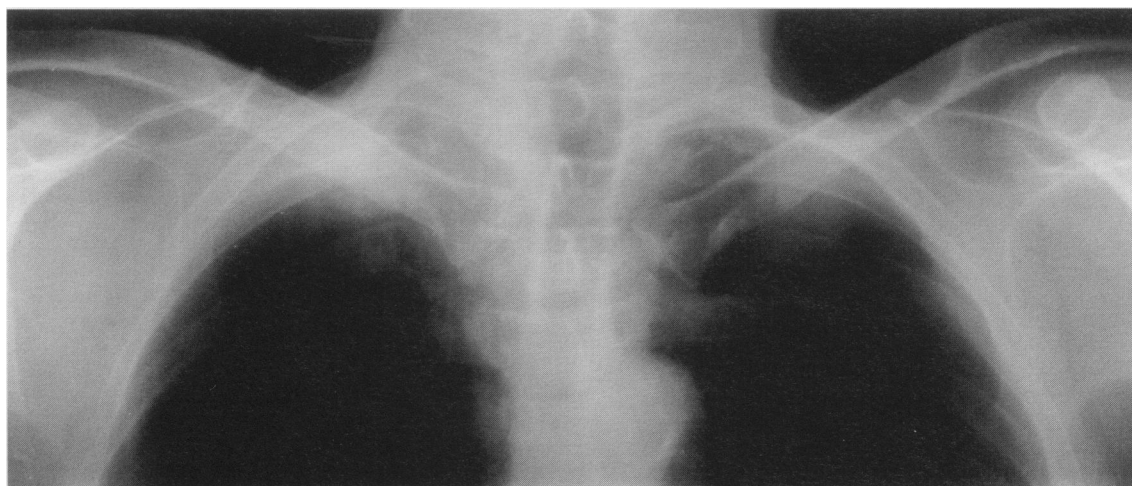
Extensive tumours, diagnosed in late stages, are considered only for palliative radiotherapy and have poor prognosis. In selected cases, when the tumour has been diagnosed early, pre-operative radiotherapy followed by local resection may provide good palliation in the majority of the patients and long-term survival in one-third of them.<sup>7</sup>

Failure to consider the Pancoast tumour in the differential diagnosis appears to be the most common cause for delay in diagnosis. Most of the patients are treated under a presumptive diagnosis of shoulder bursitis, cervical spondylosis, or thoracic outlet syndrome and some of them have unnecessary operations as laminectomies, foraminotomies or operations in the limb.<sup>4</sup>

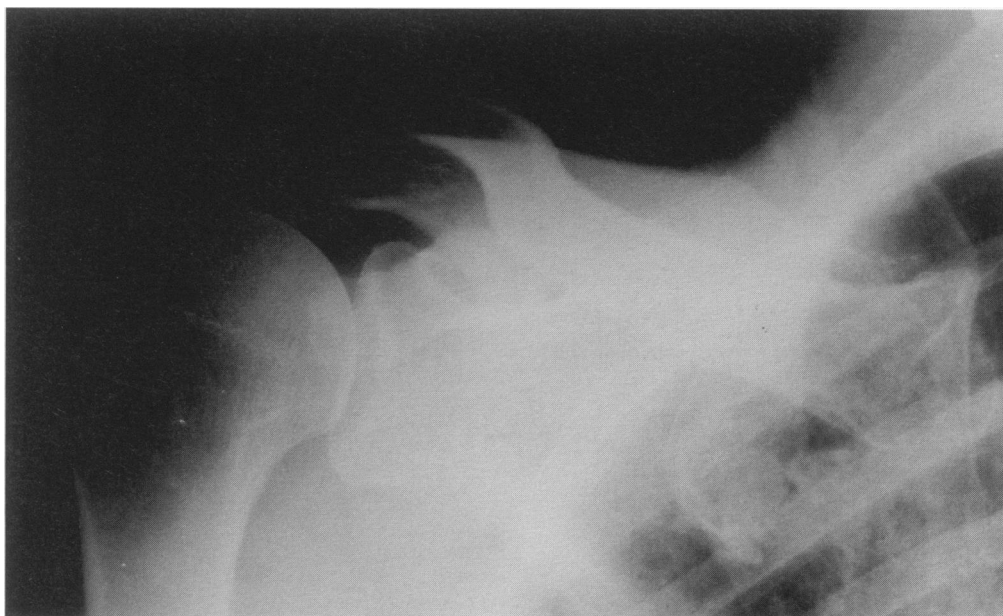
In our cases, the diagnosis was correctly made after average 18.5 months from the beginning of their symptoms. Two of the patients had positive radiological findings, which were missed, 16 and 6 months, respectively, before the diagnosis was made. One of them had an unnecessary operation.

All of the four patients were either smokers or ex-smokers and all had weight loss, two of them at the time that they first presented in the clinic and the other two subsequently.

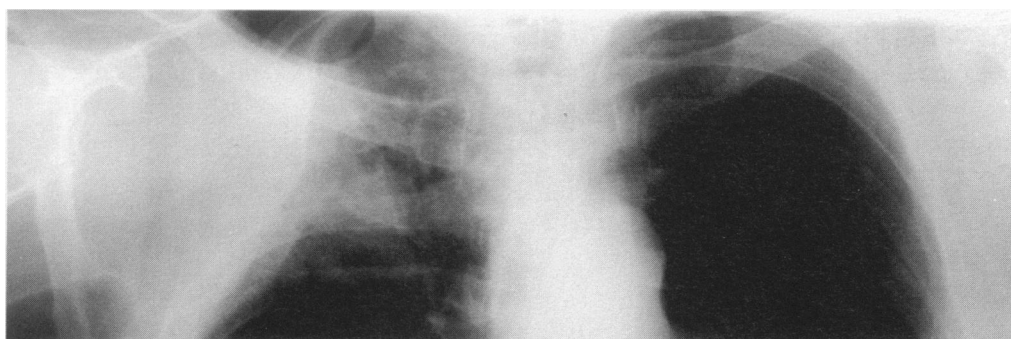
We would like to emphasise that the diagnosis of Pancoast tumour should be kept in mind whenever the



**Figure 6** The upper half of the (PA) view chest X-rays in case 3. Note the Pancoast lesion in the apex of the right lung



**Figure 7** The (AP) view of the right shoulder X-rays of case 4. The joint itself is within normal limits but there is an obvious opacity in the apex of the right lung



**Figure 8** The upper half of the (PA) chest X-rays in case 4. Note the Pancoast lesion in the apex of the right lung

patient has shoulder or lower neck pain with or without neurological signs in the ipsilateral upper limb.

We recommend thorough evaluation of the chest and high index of suspicion in middle-aged persons with a history of smoking or history of weight loss.

The high incidence and common observation of cervical spondylosis or calcific bursitis, or both, in the same population should make us exercise caution when attributing the symptoms to those conditions.

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